

WHAT IS CLAIMED IS:

1 1. In a network comprising a plurality of nodes, a method for assigning a different network
2 address to each node, the method comprising each node performing the steps of:

3 broadcasting a unique identifier for the node to the other nodes, wherein each node has a
4 different unique identifier;

5 receiving unique identifiers for the other nodes; and

6 assigning a different network address to each of the nodes based on the unique identifier
7 received from the node, wherein each node assigns network addresses in a
8 common predetermined manner.

9 2. The method of claim 1 wherein:

10 the nodes are coupled to form a ring; and

11 the step of broadcasting a unique identifier for the node to the other nodes comprises
12 transmitting the unique identifier around the ring.

13 3. The method of claim 2 wherein the step of transmitting the unique identifier around the
14 ring comprises, at each node:

15 receiving the unique identifier;

16 storing the unique identifier and retransmitting the unique identifier to a next node on the

17 ring, if the node did not originate the broadcast of the unique identifier; and

18 not retransmitting the unique identifier, if the node did originate the broadcast of the

19 unique identifier.

20 4. The method of claim 1 wherein the nodes are coupled in a mesh configuration.

21 5. The method of claim 1 wherein the unique identifier comprises a Media Access Control
22 (MAC) address.

- 1 6. The method of claim 1 wherein the network address comprises an Internet Protocol (IP)
2 address.
- 1 7. The method of claim 1 wherein the step of assigning a different network address to each
2 of the nodes comprises:
3 in an address table comprising a plurality of records, each record corresponding to one of
4 the nodes, inserting the unique identifier received for a node into a record for the
5 node; and
6 inserting a different network address into each of the records based on the unique
7 identifier in the record, wherein each node determines which network address to
8 insert into each record in a common predetermined manner.
- 9 8. The method of claim 1 wherein the step of assigning a different network address to each
10 of the nodes comprises:
11 assigning the network addresses sequentially from a predetermined set of network
12 addresses.
- 13 9. The method of claim 1 wherein the nodes form part of a public switched telephone
14 network.
- 15 10. The method of claim 1 wherein:
16 the unique identifier includes a MAC address and the network address includes an IP
17 address;
18 the nodes are coupled to form a ring;
19 the step of broadcasting a unique identifier to the other nodes comprises, at each node:
20 receiving the unique identifier;
21 storing the unique identifier and retransmitting the unique identifier to a next node
22 on the ring, if the node did not originate the broadcast of the unique
23 identifier; and

10 not retransmitting the unique identifier, if the node did originate the broadcast of
11 the unique identifier; and
12 the step of assigning a different network address to each of the nodes comprises:
13 in an address table comprising a plurality of records, each record corresponding to
14 one of the nodes, inserting the MAC address received for a node into a
15 record for the node;
16 sequentially assigning IP addresses to each of the nodes; and
17 inserting the assigned IP address into the record for the node.

1 11. The method of claim 1 wherein:
2 the step of broadcasting a unique identifier to the other nodes further comprises, for at
3 least one node, broadcasting a network address along with the unique identifier;
4 and
5 the step of assigning a different network address to each of the nodes comprises:
6 assigning the network address broadcast along with the unique identifier to the at
7 least one node; and
8 assigning a different network address to each of the nodes other than the at least
9 one node in a common predetermined manner.

1 12. In a network comprising a plurality of nodes, a method for assigning a different network
2 address to each node, the method comprising each node performing the steps of:
3 periodically broadcasting a unique identifier for the node to the other nodes, wherein each
4 node has a different unique identifier;
5 receiving unique identifiers for the other nodes; and
6 in an address table comprising a plurality of records, each record corresponding to one of
7 the nodes and including a unique identifier for the node and a network address for
8 the node:

9 if a record containing the unique identifier does not exist, creating a new record
10 and inserting the received unique identifier into the record; and
11 if a record containing the unique identifier does exist, updating the record; and
12 reassigning the network addresses in the records based on the unique identifiers in the
13 records, wherein each node determines which network address to assign to each
14 record in a common predetermined manner.

1 13. The method of claim 12 wherein the step of reassigning the network addresses in the
2 records comprises:

3 determining which records are unexpired; and
4 reassigning the network addresses only for unexpired records.

5 14. The method of claim 12 wherein the step of reassigning the network addresses in the
6 records comprises:

7 reassigning the network addresses only when a new record is created.

8 15. The method of claim 12 wherein:

9 the record for a node further includes a time to live field indicating a time remaining until
10 expiration of the record; and

11 the step of updating the record comprises resetting the time to live field for the record.

12 16. The method of claim 15 wherein:

13 the step of periodically broadcasting a unique identifier to the other nodes comprises all
14 nodes broadcasting their unique identifiers once per a time interval; and

15 the step of resetting the time to live field comprises resetting the time to live field to a
16 value at least two times as long as the time interval.

17 17. The method of claim 15 wherein the step of reassigning the network addresses in the
18 records comprises:

19 marking a record as expired when the time to live field for that record expires; and

reassigning the network addresses only for unexpired records.

18. The method of claim 12 further comprising proxying the unique addresses for records which have expired but have not been purged.

19. The method of claim 12, wherein:

the unique identifier includes a MAC address and the network address includes an IP address;

the nodes are coupled to form a ring;

the record for a node further includes a time to live field indicating a time remaining until expiration of the record;

the step of periodically broadcasting a unique identifier to the other nodes comprises, at each node:

receiving the MAC address;

storing the MAC address and retransmitting the MAC address to a next node on the ring, if the node did not originate the broadcast of the MAC address; and

not retransmitting the MAC address, if the node did originate the broadcast of the MAC address;

the step of updating the record comprises resetting the time to live field for the record; and

the step of reassigning the network addresses in the records comprises:

marking a record as expired when the time to live field for that record expires; and sequentially assigning IP addresses only for unexpired records and only when a new record is created.